Introduction

In this module, we will go through the basic elements from which Python programs are composed. These include different data types for both texts and numbers, and also the expressions that manipulate them. Then, we will give an introduction on how to use functions (or reusable code blocks) and modules in Python programs.

Topics and Learning Objectives

Topics

- Basic types and text processing
- Numeric data types and character sets
- Using functions and methods

Learning Objectives

By the end of the module, you will be able to:

- Apply different data types in arithmetic operations.
- Construct a simple Python program that employs arithmetic operators and operands.

Readings

Required Readings

- Lambert, K. A. (2019). *Fundamentals of Python: First programs* (2nd ed.). Boston, MA: Cengage Learning.
    - Software Development, Data Types, and Expressions, pages 34–63

Basic Types and Text Processing

Please watch and study this video presentation as it explains the basic data types or different collection of values, and how Python processes them. In this topic, we will learn how to initiate a string, create a variable, and add a comment. Also, we will learn the difference between valid and invalid variable names in Python.

Ryecast Video:
CIND830 - Module 2: Basic Types and Text Processing

Download

Download the PDF file for **CIND830 - Module 2: Data Types and Expressions.**

Please note this PDF file will be used in all three videos of this module. In the PDF, you can use the top navigation bar to navigate between the topics covered in each video.

Download the **CIND830 - Module 2: Basic Types and Text Processing transcript**.

Numeric Data Types

In this next video, we will cover the numeric data types to learn the difference between integers and real numbers, which we will be calling “floating-point” numbers. Then, we will learn how to use these types and build an arithmetic expression with the help of a specific set of operators.

Ryecast Video:
CIND830 - Module 2: Numeric Data Types

Download

Download the PDF file for **CIND830 - Module 2: Data Types and Expressions** and click on the topic “**Numeric Data Types**” in the top navigation bar to take you to the beginning of this topic.

Download the **CIND830 - Module 2: Numeric Data Types transcript**.

Functions and Modules

Now, we will go through how to call a function and how to use functions that are embraced by a module in Python. Functions like **abs()** and **round()** from the **__builtin__** module are always available for use. However, programmers must explicitly import other functions from other modules where they are defined. We will

practice the techniques that can be used to import those functions or resources to ensure maintainability and reusability.

Ryecast Video:
CIND830 - Module 2: Functions and Modules

Download

Download the PDF file for **CIND830 - Module 2: Data Types and Expressions** and click on the topic "**Functions and Modules**" in the top navigation bar to take you to the beginning of this topic.

Download the **CIND830 - Module 2: Functions and Modules transcript**.

Self-Assessment Quiz

Please complete the following review activity. The activity is not graded.

Test Yourself

H5P Object:
Self-Assessment Quiz

Summary

In this module, we learned the difference between a data type and literal; basic and complex data types; and comments and docstrings in Python. We also learned how to use integers, floating-point numbers, to construct arithmetic operations. We also practiced how to initialize and use variables with valid names in Python and know about the syntax errors that might occur upon using invalid names to initialize a variable. Priority of arithmetic operators is critical as it depends on the language itself. We also covered the techniques that can be used to import functions and resources from specific modules in Python. In the next module, we will learn how to use control statements in Python, specifically the repetition statements or those statements in Python which repeat a set of actions or iterate through them to create a new set of actions that depend on the original ones.

Activities

Discussion

Module 2 Discussion

This week, let's discuss data types and expressions in the **Module 2 Discussion** topic in D2L under the **Communication** drop-down menu, then **Discussions**. Feel free to start a new thread or respond to someone else's post.

Lab Activity

Lab 1

Before starting Lab 1, be sure you have reviewed all the content in Module 2. The lab is a practical extension to apply your knowledge gained from this module. Download Lab 1 now and complete it by the end of this week. Your instructor will give you time to work on it before releasing the solutions in a folder called **Lab Solutions** in D2L under the **Course Materials** drop-down menu for you to verify your answers. The lab activity is not graded.

While working on your lab, post any questions, ideas, and strategies in the **Module 2 Discussion** topic in D2L. Feel free to read and respond to your peers' posts as well. You may also have the option of reaching out to your instructor during his/her virtual office hours.

Please note: The PDF for the lab activity may not be fully accessible for students who use assistive technology. If you require an accessible version, please contact your instructor.

Assessments

Quiz Module 2

Please go to your D2L course shell, under the **Assessment** drop-down menu, and select **Quizzes**. Then, click on the **Quiz Module 2 link** and follow the instructions to complete this quiz. Date and length of time have been set for this quiz. **This quiz is a cumulative 10% of your final grade.**

Assignment 1

This week you are starting **Assignment 1 (worth 15% of your final grade)**. In D2L, go to the **Assessment** drop-down menu, then **Assignments**. Click on the **Assignment 1 link**. Read the description and follow the instructions to complete your assignment.

You are expected to submit both the notebook file (in IPYNB format) and the exported version (either in PDF or HTML format) in the same Assignment 1 link in D2L. Failing to submit both files will be subject to a mark deduction.

While you are working on this assignment, feel free to share your questions, ideas and strategies in the **Assignment 1 Discussion** topic in D2L.

References

- Lambert, K. A. (2019). *Fundamentals of Python: First programs* (2nd ed.). Boston, MA: Cengage Learning.